UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 02531

CSAH NO. 30

OVER THE

RUM RIVER

DISTRICT 5 - ANOKA COUNTY

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 5221 (CEI 107)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure units inspected at Bridge No. 02531, Piers 1 and 2, were found to be in good condition with no defects of structural significance observed. Minor local scour depressions were observed at most of the columns at both piers. Minor undermining of the slope protection was observed at both the east and west embankments. Moderate accumulations of timber debris were encountered at both piers. The channel bottom around the substructure appeared stable with evidence of minor local scour, but with no appreciable changes since the previous inspection.

INSPECTION FINDINGS:

(A) Minor local scour depressions, 2 feet in radius and 1 foot deep, were found at the downstream end of the downstream column of Pier 2.

(B) Minor scour depressions were observed around all of Pier 1 columns with a maximum radius of 2 feet and a maximum depth of 1.5 feet. The extent of the scour diminished gradually towards the downstream end of the pier.

(C) Portions of the concrete edge of the east embankment slope protection were broken off with undermining along the embankment having a maximum height of 2 feet and maximum horizontal penetration of 1.5 feet. The west embankment slope protection exhibited similar undermining with a maximum height of 1 foot and a maximum horizontal penetration of 1 foot.

(D) The concrete surfaces of the columns and webwalls of both piers were generally smooth and sound with random minor areas of poor consolidation with up to 1/4 inch penetration.

(E) A light accumulation of timber debris consisting of 3-inch-diameter and smaller branches was observed around the entire perimeter of Pier 1. Pier 2 had a light accumulation of timber debris consisting of 6-inch-diameter and smaller branches observed around the entire perimeter. The timber debris around both piers extended from the channel bottom up 2 feet and 3 feet out from both the faces and noses of the piers.

RECOMMENDATIONS:

(A) Monitor the drift at the piers during future inspections and if found to be progressing removal of the accumulations of timber debris from around the piers may be warranted at that time.

(B) Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2008 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 02531

Feature Crossed: The Rum River

Feature Carried: CSAH No. 30

Location: District 5 - Anoka County

Bridge Description: The bridge superstructure consists of three spans of multiple prestressed concrete girders supporting a reinforced concrete deck. The superstructure is supported by two reinforced concrete abutments and two reinforced concrete piers. The piers are supported by concrete footings founded on cast-in-place concrete piles. The piers are numbered 1 and 2 starting from the west end of the bridge.

2. INSPECTION DATA

Professional Engineer/Team Leader: Bradley A. Syler, P.E., S.E.

Dive Team: John Loftus, Valerie Roustan.

Date: August 13, 2007

Weather Conditions: Sunny, ± 75° F

Underwater Visibility: ± 2 Feet

Waterway Velocity: Negligible/None

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Piers 1 and 2.

General Shape: The piers each consist of a row of six reinforced concrete circular columns, which directly support the concrete girders. The upper halves of the columns are connected by slender concrete diaphragms. The columns are supported by a continuous reinforced concrete footing founded on cast-in-place concrete piles.

Maximum Water Depth at Substructure Inspected: Approximately 9.4 feet.

4. WATERLINE DATUM

Water Level Reference: The top of pier cap at the downstream end of Pier 1.

Water Surface: The waterline was approximately 9.0 feet below reference.
Waterline Elevation = 844.2.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

Item 61: Channel and Channel Protection: Code 7

Item 92B: Underwater Inspection: Code B/08/07

Item 113: Scour Critical Bridges: Code I/91

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

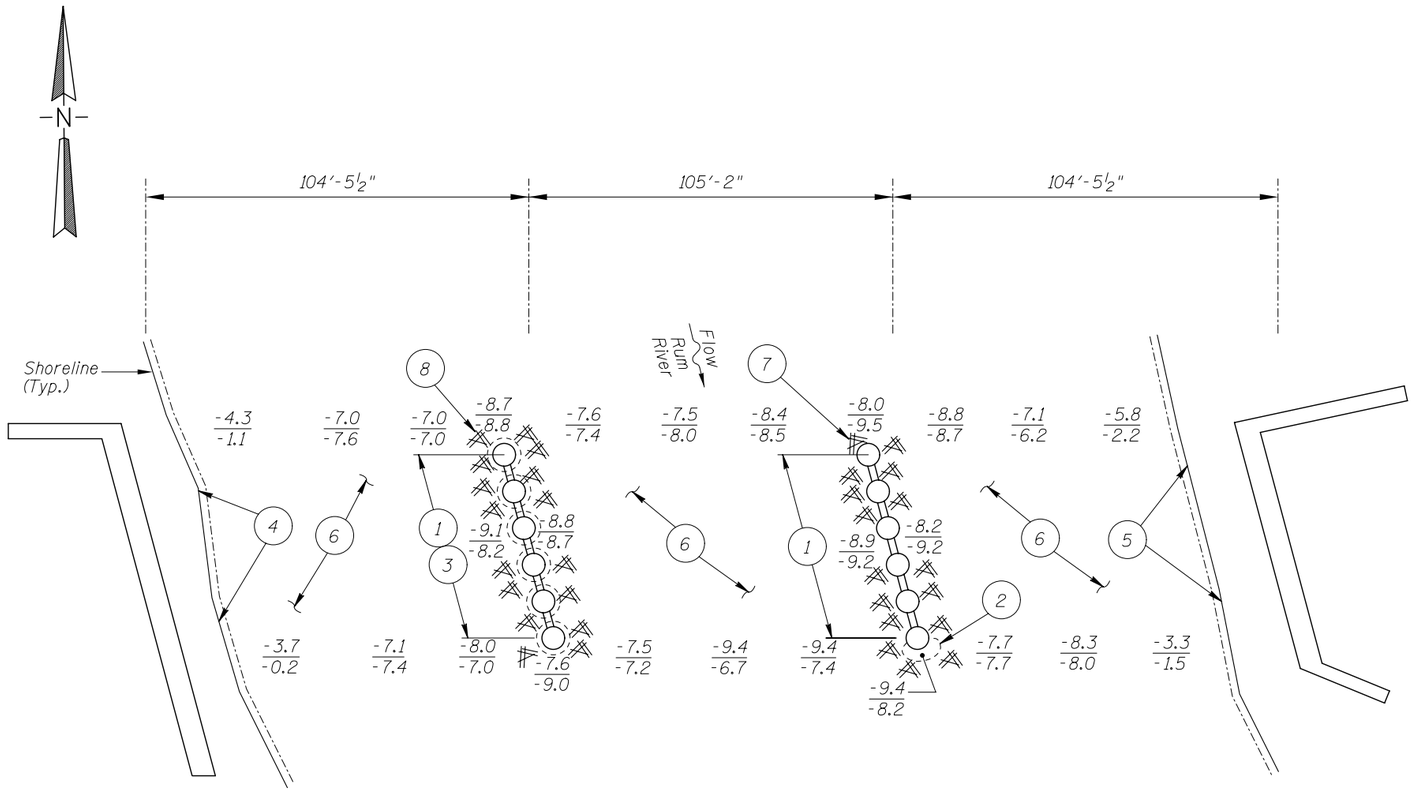
_____Yes X No

Photograph 1. Overall View of Bridge, Looking South.

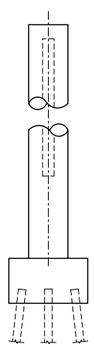
Photograph 2. View of Pier 1, Looking Northeast.

Photograph 3. View of Pier 2, Looking East.

Photograph 4. View of West Slopewall, Looking South.



SOUNDING PLAN



TYPICAL END VIEW OF PIERS

GENERAL NOTES:

1. Piers 1 and 2 were inspected underwater.
2. At the time of inspection on August 13, 2007, the waterline was located approximately 9.0 feet below the top of Pier 1 at the downstream end. This corresponds to a waterline elevation of 844.2 based on the previous report dated September 24, 2002.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at 1/4 point intervals between the substructure units as well as around the pier structures.

INSPECTION NOTES:

(1) The concrete surfaces of the columns and webwalls of both piers were generally smooth and sound with random minor areas of poor consolidation with up to 1/4 inch penetration.

(2) Minor scour pocket, 2 feet in radius by 1 foot deep, was observed at the downstream end of the downstream column of Pier 2.

(3) Minor scour pockets were observed around all of Pier 1 columns with a maximum radius of 2 feet and a maximum depth of 1.5 foot, diminishing in size towards the downstream end of the pier.

(4) Portions of the concrete edge of the west slope protection were broken off with undermining along the embankment up to a maximum height of 1 foot and maximum horizontal penetration under the protection of 1 foot.

(5) Portions of the concrete edge of the east slope protection were broken off with undermining along the embankment up to a maximum height of 2 feet and maximum horizontal penetration under the protection of 1.5 foot.

(6) The channel bottom material consisted of soft sand with a maximum probe rod penetration of 1 foot around the substructure units.

(7) A minor accumulation of timber debris, consisting of 6 inch diameter and smaller branches, was observed around the entire Pier 2 from the channel bottom up 2 feet and from the pier faces and noses out 3 feet.

(8) A minor accumulation of timber debris, consisting of 3 inch diameter and smaller branches, was observed around the entire Pier 1 from the channel bottom up 2 feet and from the pier faces and noses out 3 feet.

Legend

-2.0 / -5.2 Sounding Depth (8/13/07) / Sounding Depth (9/24/02)

Scour Depression

Timber Debris

Note:

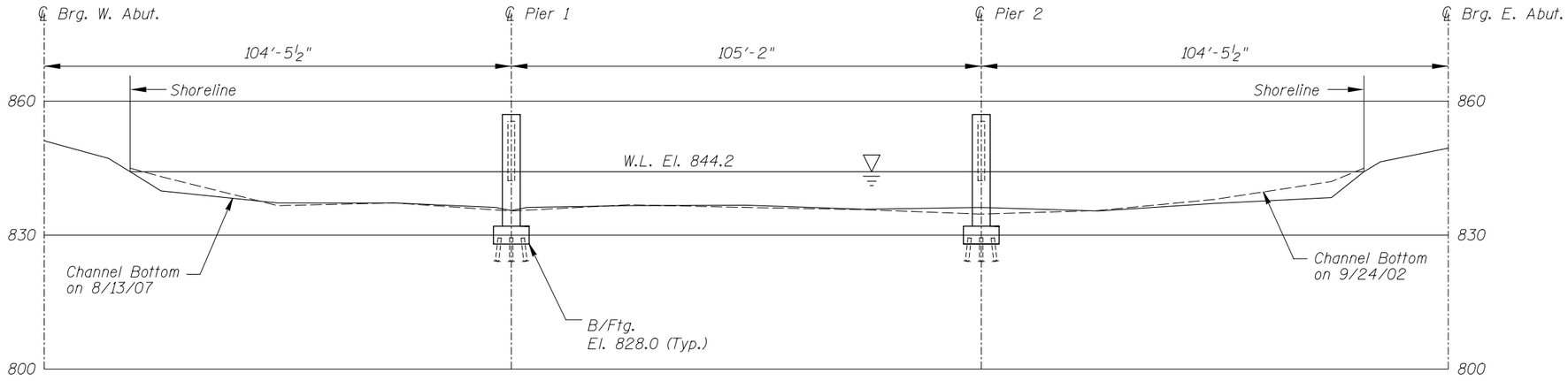
All soundings based on 2007 waterline location.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

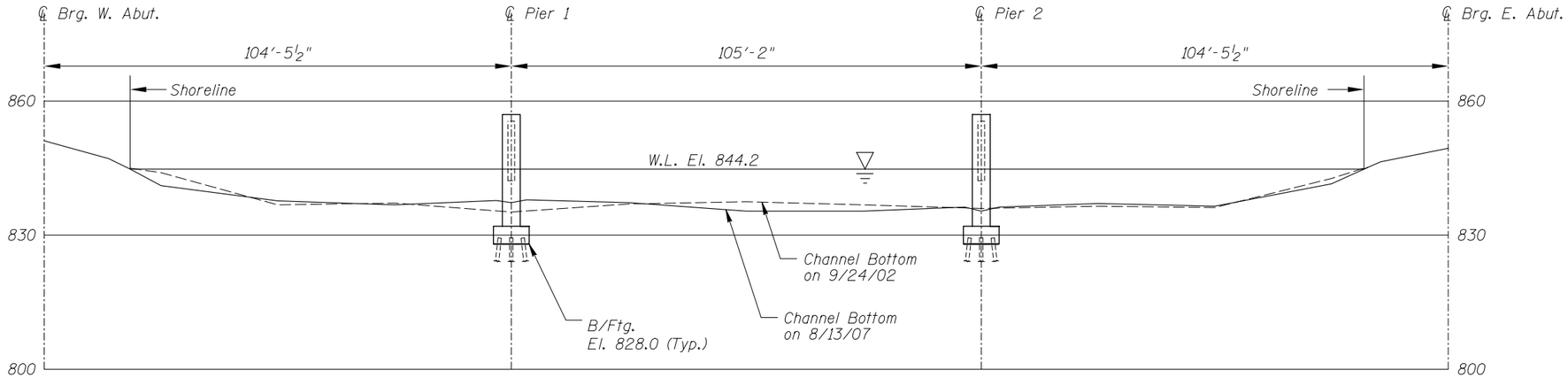
STRUCTURE NO. 02531
OVER THE RUM RIVER
DISTRICT 5, ANOKA COUNTY

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC. 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: NTS
Code: 35120107		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM
FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS 123 North Wacker Drive Suite 300 Chicago, IL 60606 (312) 704-9300 www.collinsengr.com	Date: AUGUST, 2007
Checked By: MDK		Scale: 1"=30'
Code: 35120107		Figure No.: 2

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: September 24, 2007

ON-SITE TEAM LEADER: Bradley A. Syler, P.E., S.E.

BRIDGE NO: 02531 WEATHER: Cloudy, ± 45°F

WATERWAY CROSSED: The Rum River

DIVING OPERATION: X SCUBA _____ SURFACE SUPPLIED AIR

_____ OTHER

PERSONNEL: John Loftus, Valerie Roustan

EQUIPMENT: Scuba, Probe Rod, Sounding Pole, U/W Light, Scraper, Camera

TIME IN WATER: 1:44 p.m.

TIME OUT OF WATER: 2:30 p.m.

WATERWAY DATA: VELOCITY Negligible/None

VISIBILITY ± 2 feet

DEPTH 9.4 feet maximum at Pier 2

ELEMENTS INSPECTED: Piers 1 and 2

REMARKS: Overall, the substructure units were found to be in good condition with no defects of structural significance. Minor undermining of the concreted riprap slope protection was observed at the east and west embankments. A minor accumulation of timber debris was encountered at both piers. Minor scour pockets were observed at each of the pier columns of Pier 1 with a maximum radius of 3 feet and a maximum depth of 1.5 feet. A minor scour pocket was also observed at the downstream column of Pier 2 with a radius of 2 feet and a depth of 1 foot.

FURTHER ACTION NEEDED: _____ YES X(*) NO

*Monitor the drift at the piers during future inspections and if found to be progressing removal of the accumulations of timber debris from around the piers may be warranted at that time.

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 02531
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Bradley A. Syler, P.E., S.E.
WATERWAY CROSSED Rum River

INSPECTION DATE August 13, 2007

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.	UNIT DESCRIPTION	MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 1	9.1’	N	7	N	9	N	7	7	7	6	7	7	7	N	N	N	N	N
	Pier 2	9.4’	N	7	N	9	N	7	7	7	6	7	7	7	N	N	N	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, the substructure units were found to be in good condition with no defects of structural significance. Minor undermining of the concreted riprap slope protection was observed at the east and west embankments. A minor accumulation of timber debris was encountered at both piers. Minor scour pockets were observed at each of the pier columns of Pier 1 with a maximum radius of 3 feet and a maximum depth of 1.5 feet. A minor scour pocket was also observed at the downstream column of Pier 2 with a radius of 2 feet and a depth of 1 foot.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.